FIS920030135US1
(I26-0027)

IN THE CLAIMS

1. (Currently Amended) A process for lowering fluorine content after metal fill and planarization of a metal conductor and a fluorine-containing dielectric wire structure, consisting essentially of:

generating a plasma containing atomic hydrogen species; and

exposing the fluorine-containing dielectric to the atomic hydrogen species in an amount effective to lower the fluorine content in the fluorine-containing dielectric.

2. (Canceled)

3. (Original)The process of Claim 1, wherein lowering the fluorine content comprises removing fluorine from a surface of the fluorine-containing dielectric to a depth less than or equal to about 10 percent of a thickness of the fluorine-containing dielectric.

4. (Original)The process of Claim 1, wherein lowering the fluorine content comprises removing fluorine from a surface of the fluorine-containing dielectric to a depth less than or equal to about 5 percent of a thickness of the fluorine-containing dielectric.

5. (Original)The process of Claim 1, wherein lowering the fluorine content comprises removing fluorine from at least about 200 angstroms from a surface of the fluorine-containing dielectric.

6. (Original)The process of Claim 1, wherein lowering the fluorine content comprises removing fluorine from at least about 500 angstroms from a surface of the fluorine-containing dielectric.

7. (Original)The process of Claim 1, wherein lowering the fluorine content comprises removing fluorine from at least about 700 angstroms from a surface of the fluorine-containing dielectric.

8. (Original)The process of Claim 1, wherein generating atomic hydrogen species comprises energizing a hydrogen bearing gas to form plasma containing the atomic hydrogen species or heating

the hydrogen bearing gas in a furnace to generate the atomic hydrogen species.

9. (Original)The process of Claim 1, wherein the metal conductor comprises a copper metal.

10. (Original) The process of Claim 1, wherein the fluorine content at about a surface of the fluorine-containing dielectric is less than about 2 percent after exposing the fluorine-containing dielectric to the atomic hydrogen species.

11. (Original)The polish process of Claim 1, wherein the fluorine-containing dielectric comprises a fluorinated diamond like carbon dielectric, a fluorinated diamond like carbon dielectric with additives selected from the group consisting of hydrogen, silicon germanium, nitrogen and oxygen, fluorinated silicon oxide, fluorinated silicon glass, organo-inorganic dielectrics containing fluorine, or organic dielectrics containing fluorine.

12. (Original)The process of Claim 11, wherein the plasma is formed from a gas mixture comprising a hydrogen-bearing compound.

13. (Original)The process of Claim 11, wherein the hydrogen bearing compound comprises a hydrocarbon, a hydrofluorocarbon, a hydrogen gas, a water vapor, ammonia, or mixtures comprising at least one of the foregoing hydrogen bearing compounds.

14. (Original)The process of Claim 13, wherein hydrogen gas comprises a mixture of the hydrogen gas with an inert gas.

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15. (Currently amended) A process for forming a wiring structure including a copper metal conductor and a fluorine-containing dielectric, consisting essentially of:

forming a gap in a layer of the fluorine-containing dielectric;

overfilling the gap with the copper metal conductor;

planarizing and removing the copper metal conductor above the fluorine-containing dielectric to expose a surface of the fluorine-containing dielectric;

forming a plasma from a hydrogen bearing gas to generate atomic hydrogen species, wherein the hydrogen bearing gas comprises a hydrocarbon, ~~ammonia,~~ a hydrofluorocarbon, a hydrogen gas, a water vapor, or mixtures comprising at least one of the foregoing hydrogen bearing compounds;

exposing the surface of the fluorine-containing dielectric to the atomic hydrogen species; and

removing fluorine from and about the surface of the fluorine-containing dielectric.

16. (Canceled)

17. (Original) The process according to Claim 15, wherein exposing the surface of the fluorine-containing dielectric lowers the fluorine in at least about 200 angstroms from the surface of the fluorine-containing dielectric.

18. (Original) The process according to Claim 15, wherein exposing the surface of the fluorine-containing dielectric lowers the fluorine in at least about 500 angstroms from the surface of the fluorine-containing dielectric.

19. (Original)The process according to Claim 15, wherein exposing the surface of the fluorine-containing dielectric lowers the fluorine in at least about 700 angstroms from the surface of the fluorine-containing dielectric.

20. (Original)The process according to Claim 15, wherein exposing the surface of the fluorine-containing dielectric lowers an amount of the fluorine from the surface to a depth less than or equal to about 20 percent of a thickness of the fluorine-containing dielectric.

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21. (Original)The process according to Claim 15, wherein the fluorine-containing dielectric comprises a fluorinated diamond like carbon dielectric, a fluorinated diamond like carbon dielectric with additives selected from the group consisting of hydrogen, silicon germanium, nitrogen and oxygen, fluorinated silicon oxide, fluorinated silicon glass, organo-inorganic dielectrics containing fluorine, or organic dielectrics containing fluorine.

22. (Original)The process according to Claim 15, wherein exposing the surface of the fluorine-containing dielectric lowers an amount of the fluorine from and about the surface to less than about 2 percent.

23. (Currently Amended) A process for lowering fluorine content after metal fill and planarization of a metal conductor and a fluorine-containing dielectric wire structure, consisting essentially of:

generating atomic nitrogen species from nitrogen gas (N_2) or a mixture containing the nitrogen gas (N_2); and

exposing the fluorine-containing dielectric to the atomic nitrogen species in an amount effective to lower the fluorine content in the fluorine-containing dielectric.